



BEEKEEPING MANUAL

For Missoula Beekeepers

- Maintain a safe, hygienic, and healthy apiary
- Educate the next generation of citizens on the importance of bees
 - Inspire participation in bee conservation

2017

GARDEN CITY HARVEST
Created by Zabeth Runyan

TO THE READER:

The objective of this Beekeeping Manual is to provide new beekeepers with readily accessible information. This essential hive management information is presented in monthly installments. The advice and information contained are based on general beekeeping knowledge, my own experiences, up-to-date feeding methods, and disease and pest control practices. The manual concentrates on traditional Langstroth hive beekeeping, but many of the techniques and ideas can also be used in top-bar beekeeping.

This manual is designed to promote discussion amongst and help beekeepers prevent and solve problems in Missoula County, Montana. The weather and suggested activities are guidelines but may vary due to weather fluctuations. As beekeepers, it is our job to adapt to these yearly changes accordingly. It is the responsibility of each beekeeper to maintain a hygienic hive and to recognize symptoms of disease. It is recommended to join your local beekeeping association (Big Sky Beekeepers), subscribe to a beekeeping journal, or register for the University of Montana's online beekeeping course to keep informed on the latest developments in beekeeping.

This manual is provided in good faith for general beekeeping guidance only. No liability can be accepted for loss or expense incurred from statements made in this manual.

ACKNOWLEDGEMENTS:

A big thanks goes to Big Sky Beekeepers for their support and valuable contributions to improve this Beekeeping Manual.

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MONTHLY BEEKEEPING TASKLIST

Below is a yearly checklist of basic beekeeping tasks, specific for Missoula County, Montana.
Items are discussed in more detail in each month's section.

Activity	January	February	March	April	May	June	July	August	September	October	November	December
Prepare equipment for spring	X	X									X	X
Order your Bees!	X	X										
Ensure food reserves (weather permitting)	X	X	X	X	X	X	X	X	X	X	X	X
Supplemental feeding			X	X	X			X	X	X		
Check for queen & brood/brood pattern					X	X	X	X	X			
Inspect for swarm/supersedure cells					X	X	X					
Reverse hive bodies					X							
Routine monitoring for Varroa mites		X	X	X	X	X	X	X	X	X		
Treating for Varroa mites if detected				X				X				
Monitor for robbing						X	X	X	X			
Routine monitoring for pests						X	X	X	X			
Overwinter hive (i.e. wrap, ventilation)								X	X			

JANUARY

WEATHER FORECAST MISSOULA, MONTANA

Average high: 33°F
Average low: 18°F

THE BEEKEEPER

Little work is required from the beekeeper this month. If there is snow, make sure the entrance is clear to allow for proper ventilation.

Order Bees if you intend to add or replace honeybee colonies. Below are some suppliers recommended by Big Sky Beekeepers. Generally, delivery date is expected to be in late April.

Western bee Supplies – 3lbs package available

(406) 883-2918 <http://westerbee.com>

Sunrise Honey Company – Nucs available

(509) 936-1088 <http://sunrisehoney.com/index.html>

Northwest Bee Supply – Both packages and nucs available

(855) 796-8544 <http://store.northwestbeesupply.com/bigfork/missoula>

Murdoch's – Packages available

(406) 549-2355

Arlee Apiaries – Nucs available

(406) 560-1307 <http://www.facebook.com/Arlee-Apiaries>

THE BEES

To successfully overwinter, the worker bees form a tight cluster surrounding the queen to stay warm. There is not much activity or honey consumption this month.

Before ordering bees, consider the following breeds:



Italian Honey Bees are one of the most common to domesticate for beekeeping. They are gentle and easy to handle, and have a moderate tendency to swarm. They do have a higher tendency to rob weaker hives.



Carniolans originate from Slovenia. Colonies are very gentle, and are well suited for cold environments with long winters. Bees have a high tendency to swarm during the spring and are sensitive to dearths.



Russian Bees are highly mite resistant, and have the ability to overwinter more successfully on relatively small honey and pollen stores. Colonies are slow to build populations and are subject to swarming.



Caucasian queen bees can naturally cohabitate. They are known for their gentleness and productivity. They do not overwinter well in northern climates due to their susceptibility to nosema, drifting and robbing.

FEBRUARY

WEATHER FORECAST MISSOULA, MONTANA

Average high: 39°F
Average low: 21°F

THE BEEKEEPER

Check bee's food supplies. This can be done by gently lifting the back of the hive. It should weigh between 60-100 lbs. If it feels light, emergency feeding with dry sugar, fondant, and or a pollen patty is recommended (weather permitting).

This is a good time to repair or build your bee equipment. If you live in an area with an active bear population, a fence should be considered before installing honey bees to prevent predator disturbances to your beehives.

This is a good time to read-up on bees! There are also copious amounts of YouTube videos available online.

Recommended books:

- *The Beekeeper's Handbook* by Diana Sammataro
- *Storey's Guide to Keeping Honey Bees* by Malcolm Thomas and Richard Bonney
- *First Lessons in Beekeeping* by Camille Dadant
- *The Complete Idiot's Guide to Beekeeping*
- *Beekeeping in Western Canada* by John Gruszka

THE BEES

The queen will start to lay eggs, so the worker bees will have to raise the temperature of the cluster to keep the brood warm. This means they will start to consume more honey stores.

MARCH

WEATHER FORECAST

MISSOULA, MONTANA

Average high: 50°F

Average low: 28°F

HOUSEKEEPING

1. Carry out health inspections regularly, checking for brood & diseases in spring and fall.
2. Never transfer combs between colonies without checking for diseases.
3. Systematically replace (every 3-5 years) old brood combs in your hive to maintain clean and healthy hive.
4. Avoid bringing in colonies or equipment into apiary without establishing origin, condition and disease status.
5. Sterilize 2nd hand equipment.

THE BEEKEEPER

If the weather is calm, and 50 degrees or warmer, you can open the hive to check for food reserves. Popular feeding options include: Boardman entrance feeder, top-feeder, frame feeder, or swap a frame full of honey for empty frame (refer to page 18).

- March - May feed bees, *if needed*, a 1:1 sugar to water syrup.
- DO NOT REMOVE any frames, if it is 50 degrees or cooler, as this will chill the brood.
- On warm winter days, bees fly out of the hive to defecate. The hive entrance must be clear of ice and snow for defecation as well as good hive ventilation.

Monitor/treat for Diseases and Pests (refer to page 22)

- Monitor for Varroa mites by checking the board.
- Monitor for Nosema by observing defecation inside or outside of hive.

You might consider placing a pollen patty on top of the upper deep box at this time. This will stimulate the queen into laying eggs.

THE BEES

As days get warmer and longer, the queen increases her rate of egg laying, making colonies sensitive to starvation. If supplied with enough supplemental feeding and honey reserves for the winter, they should have enough stores.

When the weather is 50 degrees or above, workers will take **cleansing flights**.

APRIL

WEATHER FORECAST MISSOULA, MONTANA

Average high: 58°F
Average low: 33°F

TIP

Remember that an intrusion into the hive increases bees stress level. Every time it is inspected the bees need hours, or days to recover. Be clear about your **PURPOSE** of the hive inspection and what to look for – generally once every 14 - 21 days.

THE BEEKEEPER

If bees are struggling to survive off winter honey, feeding should be considered. Feeding is a controversial topic, but if done correctly may save your hive. Refer to page 18 for feeding methods.

- *Varroa destructor* mite is part of every colony since the last three decades, hence we must take its cycle into consideration. Drones introduce mites, and are universally accepted into colonies, thus becoming a primary distributor of mites among hives. During the spring and summer, most mites are found on the brood and in late fall, many attach to adult worker bees. This means you should treat multiple times thorough the bee's life cycle.
- *Check bottom board for a rough estimate of mite level.*

**For information on other diseases and pests
refer to:** <http://www.fao.org/3/a-a0849e.pdf>.

THE BEES

The bees are almost fully operational and are beginning to bring nectar and pollen into the hive. The queen is laying her spring brood and drones are beginning to appear.

Note: Bee's natural defense to diseases and pests lie in their health care plan. Adult hygienic behavior (i.e. cleaning and grooming) is a trait that breeding programs are starting to employ.

MAY

WEATHER FORECAST

MISSOULA, MONTANA

Average high: 67°F

Average low: 40°F

VARROA DESTRUCTOR

Prevention is the best method of controlling honeybee diseases, by maintaining healthy, strong and vigorous colonies that display good hygienic traits.

If you intend on doing a spring Varroa mite treatment, now is a good time. Oxalic Acid treatment is currently the least harmful and effective treatment. Do not medicate with Oxalic Acid when honey supers are in place.

***Contact Big Sky Beekeepers for Oxalic Acid treatment for a nominal fee.**

THE BEEKEEPER

On a warm, still day you can do your first comprehensive inspection! The first inspection is important and should be brief.

There is one objective: to check if the queen has either been released (if installed a week prior) or is functioning. Avoid eating bananas (see alarm pheromone), wearing dark colors or strong perfume.

Can you find the queen?

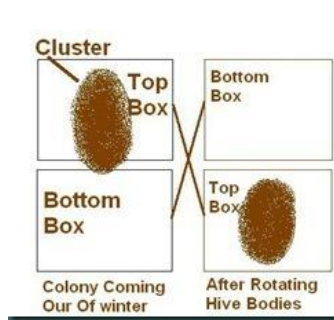
Even if you can't locate the queen right away, you can check for clean cells filled with healthy eggs and brood, capped brood, and a nicely clustered brood pattern (refer to pg. 21). This will tell you that the queen is alive and well.

- One of the signs of a failing queen is if she begins intermixing drone brood with worker (drone cells are conspicuous because they protrude out beyond the surface of the comb).

THE BEES

The bees should be jazzed and bursting with activity. The queen will be laying eggs and workers will be collecting nectar and pollen.

Swarming occurs May – August. Look for supersede cells, usually located in the middle of combs. Like swarm cells, these are created by workers for rearing new queens. Supersedure queens are back-ups, created as an insurance policy in case the current queen dies or performs poorly. You may choose to allow supersedure to occur, or you may remove them and buy a new queen from a supplier.



JUNE

WEATHER FORECAST

MISSOULA, MONTANA

Average high: 75°F

Average low: 47°F

SWARM CELL WATCH

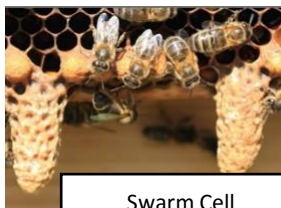
Look for swarm cells usually located along the bottom of frames. Swarm cells house developing new queens, made when the hive is preparing to swarm. This is a key sign that the hive is becoming crowded. Beekeepers commonly break them off and add a honey super. More advanced beekeepers sometimes preserve them and establish new start-up colonies.



Bearding



Festooning



Swarm Cell

THE BEEKEEPER

The bees will be filling supers this month (except for first year of installation), so there is no need to feed the bees. Upon inspection, if under the lid reveals comb built up, it is a clear sign that the bees need more space to build comb. Continue to check for brood, and a healthy laying pattern (refer to page 21).

- Remember, if you find larva and capped brood, look no further for the queen. Your inspections should have a purpose and be short and sweet.
- Add a honey super (*if needed).
- Check bottom board for mites.

THE BEES

This month should be a main honey flow for the hive and should be teeming with bees. You may see the bees hanging out on the front of the hive at night. This is due to the heat, and they are simply cooling off. This phenomenon is called “**bearding**.”

A lacework or chain of bees hanging together, almost as if they are holding hands, between the frames of comb is called a “festoon”. **Festooning** may be observed during inspection this month and is not cause for alarm. Why bees festoon is still widely unknown, but it is thought to be a form or measurement to determine the distance between frames.

JULY

WEATHER FORECAST

MISSOULA, MONTANA

Average high: 86°F

Average low: 51°F

PESTS

Bears can cause significant damage to individual bee yards.

Control Method:

- Electric fences effectively prevent bear damage to beehives

Wasps/hornets can cause serious damage to a hive by invading the hive.

Control Methods:

- Bait-trapping
- Reducing hive entrance
- Install robbing screens

Ants are among the most common predators.

Control Methods:

- Coffee cans under legs of hive stand filled with vegetable oil

THE BEEKEEPER

Continue inspections to assure the health of the colony.

- Add more honey supers if needed
- Check for Varroa mites
- Control pests

THE BEES

Bees are behaving similar to June. If the weather is pleasant, the nectar flow will continue this month.

ROBBING

Robbing from neighboring bees or wasps is most common during a nectar dearth. It can be prevented by not using a Boardman feeder, but a division board feeder or top-feeder, and reducing the hive entrance. By reducing the entrance bees have a better chance at successfully defending their hive. Robbing can be identified by: fighting at entrance, dead bees or comb on the landing board, or loud buzzing.



Robbing



Varroa Mite

AUGUST

WEATHER FORECAST MISSOULA, MONTANA

Average high: 85°F
Average low: 50°F



Honey Supers

THE BEEKEEPER

August to October check food reserves for bees to overwinter on. If you have honey supers on, don't feed until honey supers are removed for harvesting. If needed, start feeding bees a 2:1 sugar to water syrup ratio.

- Stay alert for honey robbing by wasps or neighboring bees!

THE BEES

This month the bees will hit their peak population. Start thinking about your bees honey supply for overwintering. A typical hive eats 60-90 pounds of honey. If there is not enough honey in the brood boxes, you will need to leave one of the full honey supers on the hive.

SEPTEMBER

WEATHER FORECAST

MISSOULA, MONTANA

Average high: 73°F

Average low: 42°F

TREATING HIVES

Medicating for Varroa mites is recommended for all hives after honey super are removed.

This is an ideal month to treat for Nosema if observed. The medication can be added to feeding syrup.

THE BEEKEEPER

- Check hives for honey stores. Any hives that appear to be short on honey can be feed sugar syrup or given reserved honey frames.
- Harvest your honey crop. Big Sky Beekeepers offer members their honey extractor for use.
- **Reduce entrance** on hive to protect them from robbing of neighboring honey bees or wasps.
- Remove all your supers, leaving the two brood chambers.

THE BEES

The colony growth is decreasing and foraging activity begins to slow down as nectar flow diminishes.

An early sign that the bees are preparing for winter will be the eviction of drones. The hive population is becoming smaller as the queen's egg laying is dramatically reduced.

OCTOBER

WEATHER FORECAST MISSOULA, MONTANA

Average high: 58°F
Average low: 32°F



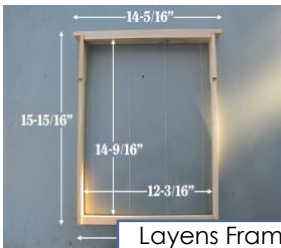
Sugar board



Dry Sugar



Roofing Paper



Layens Frame

Layens Frame- 2" thick
with 3/4 drilled hole (take
off in the spring).

THE BEEKEEPER

Prepare Hives for Winter

- **Wind** is a huge player in chilling the hive. Black corrugated hive wraps or roofing paper can be used to cover all the cracks and openings in the hive. Further, installing a wind break is recommended.
- Proper **Ventilation** is key to successfully overwintering. Hives can survive extreme cold weather, but moisture build-up can kill bees. Leave spaces for ventilation by simply reducing entrance size. This can also be done by drilling a 3/4" diameter holes in the upper brood box to give sufficient air flow (the hole can be closed by using a wine cork).
- **Food stores** are critical. Losing bees to starvation in the spring is common because they must consume more calories to keep warm. Make sure to leave at least 80 to 100 lbs. of honey (lift method to check) or start feeding until they are food secure.
- **Condense** bees into 2 deep hive bodies. If stacked any higher they will have a hard time keeping the hive warm.

Overwintering Suggestions:

- Wrap hive to insulate against cold. A simple way to wrap is to attach sheets of 1" Styrofoam (extending all the way to the ground) with bungee cords. The top must also be heavily insulated to prevent condensation from dripping on the bee cluster during cold weather.
- Filling an empty shallow super with Styrofoam, wool, or another insulating material works well.
- Another method, or in addition to, is dry sugar feeding. Place a layens frame on top, then a sheet of newspaper on top of top hive, spray with water and then pour a thick layer. This provides food for the bees as well as wicking moisture from the hive.
(refer to: <http://mudsongs.org/dry-sugar-feeding/>)

THE BEES

Bees begin to hunker down for the winter. Population and foraging decreases.

NOVEMBER

WEATHER FORECAST

MISSOULA, MONTANA

Average high: 42°F

Average low: 25°F



Flip entrance reducer

THE BEEKEEPER

Assemble / repair / replace equipment. During the winter months (November through February) there is not much work to be done with bee hives. Winter is an ideal time to clean-up dirty equipment, repair or replace broken frames and boxes, and catch up on bee-related reading.

November to December check entrance for blockage. To reduce entrance blockage (from dead bees), turn the entrance vent hole up rather than down. On warm winter days, bees will fly out of the hive to defecate. The hive entrance must be clear of ice and snow for the bees as well as good hive ventilation.

THE BEES

The cold winter months send the bees into a cluster.

DECEMBER

WEATHER FORECAST MISSOULA, MONTANA

Average high: 31°F
Average low: 17°F

THE BEEKEEPER

Enjoy the holidays!

THE BEES

The bees are now in a tight cluster surrounding the queen. If a small entrance is left, naturally dying bees will pile up at the front of the hive.

Thermal Image of winter cluster.



THE BEES LIFE CYCLE

Life span and periods of development

castes	Eggs (days)	Larva (days)	Pupa (days)	Adult (total days)
Queen 2 - 3 yrs	3	5 - 6	7	15 -16
Worker 6 - 8 weeks	3	5 - 6	10 -11	19 -20
Drone 6- 8 weeks	3	6	13 -14	23 -24

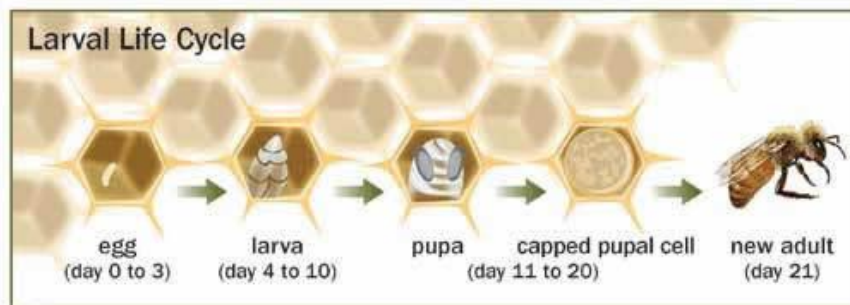
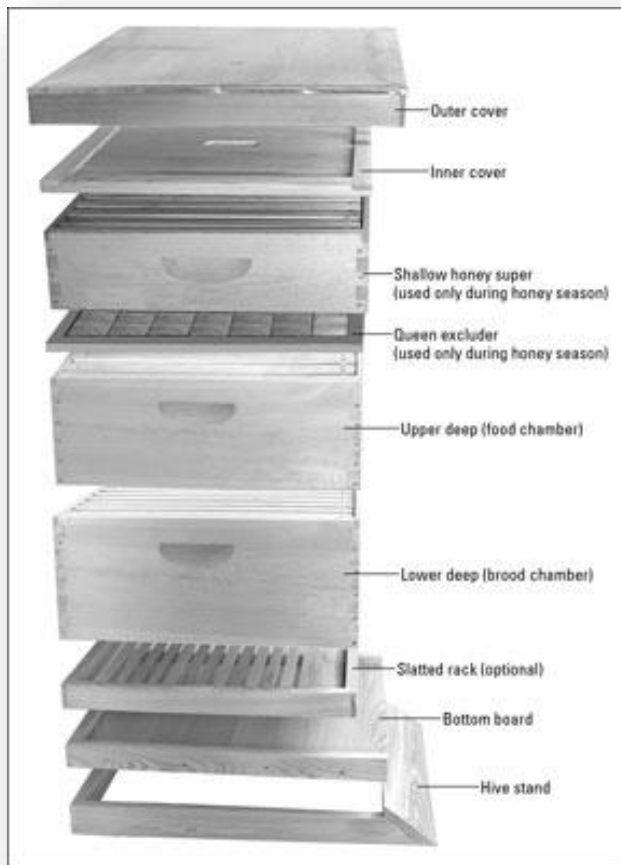


Illustration: Marguerite Meyer

BEEKEEPING EQUIPMENT



Essential beekeeper tools: Bee Brush, Smoker and hive tool.

POPULAR FEEDING METHODS

- A. Hive-Top Feeder: There are many different styles of hive-top feeders, but they all hold syrup that rests on top of the box. Refilling is not disruptive to the bees and robbing and drowning are not an issue.
- B. Boardman Entrance Feeder: These feeders are the simplest to use. They are however, the worst when it comes to robbing. It attracts robbing bees and wasps.
- C. Frame Feeder or Division Board: Place the feeder in your hive (usually taking up 1-2 frames). This method does involve disturbing the bees by opening the hive to feed. Robbing however is not an issue! Drowning has been an issue with this feeder, but either place wood sticks or a metal screen in the feeder for bees to float on.
- D. Open Feeding: Feeding Easy to use is huge advantage with open feeding. Robbing - this method initiates robbing behavior and depending on your method of open feeding, drowning may be an issue.
- E. Hive-Top Mason Jars: It is bit of a clunky method, but robbing and drowning are not an issue. To do an inspection you must remove jars



A. Hive-Top Feeder



B. Boardman Entrance Feeder



C. Frame Feeder



D. Open Feeder



E. Hive-Top mason jars

PACKAGE INSTALLATION

Necessary Ingredients for installation:

- 2 thumb tacks
- small board to place over package once queen is removed
- hive tool
- sugar spray
- feeder full of 1:1 sugar syrup

Preparation

- 1.) On day of installation, prepare hive with clean frames and preferably a few frames from the previous season with built comb and/or honey.
- 2.) Remove half of the frames and temporarily set them aside. Decide if you will install bees **directly or indirectly** after suspending the queen. Indirect installation is simply placing the package in the hive box. To directly install is to shake the bees out of the packaged box and into the hive body.



Indirect



Direct

- 3.) Put on your veil, then spray the bees through the boxed screen with sugar water to diminish their flight. Using your hive tool pry off the lid, exposing the can of sugar syrup provided by the seller. Lift the can out and remove the suspended queen in her cage.
- 4.) Immediately place small board over package hole, so bees can't escape.
- 5.) Inspect the queen in her cage. Is she alive? Are there bees in with her? Note the marking dot of paint on her thorax.
- 6.) The cage normally has two drilled holes at both ends, each plugged with a cork. One side has the queen candy. Remove the cork from the end WITH the candy. This will provide a slow release of the queen so the pheromones spread throughout the hive before she is released. If desired, in addition to the candy or if the cage doesn't come with a candy plug, insert a small marshmallow in the hole.
- 7.) There are many methods to suspend the queen. One preferred method is to use the soft metal stapled to cage. Make sure to arrange the metal so it is on the side the candy plug is. CANDY PLUG hole facing up! If it is place down, one of the worker bees in the cage with the queen may die and plug up the exit. Next, suspend the queen cage between the two center-most frames in the hive using the metal. Tack the metal onto the frame.
- 8.) The bees must be able to reach the Queen. Face the mesh toward the hive body, not toward the foundation.
- 9.) Spray the package once more. To directly install the bees, tap the box once on the ground to cluster the bees at the bottom and then turn the hive body over the empty side of the hive box. With a few gentle shakes empty most of the bees into the hive body.
- 10.) Wait at least 3 days before checking if the queen is released. If after that time she is not, you may need to remove the cork manually. Wait at least 2 days after the queen's release before examining the colony again for queen fertility.



STING REACTIONS

"I GOT STUNG!"

The honey bee has sacrificed herself for the defense of the hive. The muscles of the sting apparatus continue to pulse after the bee has detached and begin to dive deeper injecting more venom. For this reason, the stinger should be removed by scraping it off. Wash area with rubbing alcohol and apply ice to reduce swelling.

Common Normal Reaction

Whitened wheal, central red spot, localized swelling and pain, subside in in minutes to hours. Large, local reactions may also occur, subsiding in a few days.

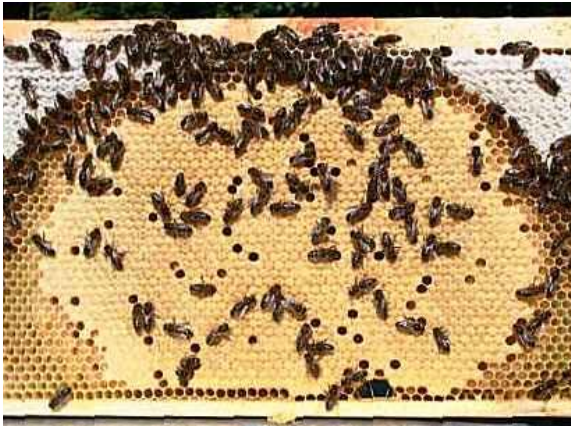
Rare Abnormal Reaction

Systemic reactions sometimes show little localized swelling, but can affect organs distant from the sting site. These may result in hives, trouble breathing because of airway swelling and or drop in blood pressure.

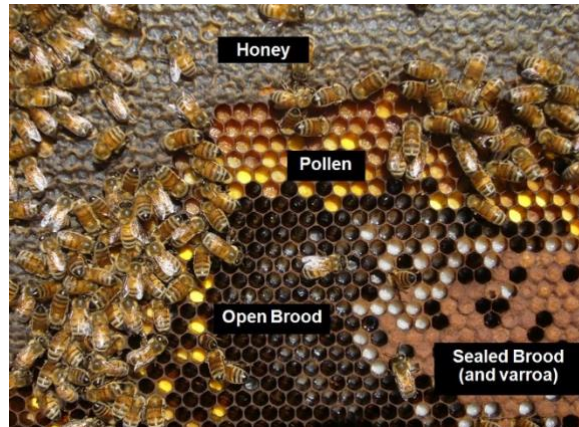
Bee Venom Therapy

Rheumatoid arthritis, multiple sclerosis (MS), skin lesions, and chronic hives are all conditions that may benefit from strategic bee stings. These ailments often involve direct immune system attacks on tissue including skin or nerves. Bee venom has the potential to help minimize symptoms.

READING A FRAME



Healthy Frame



Healthy Frame



Patchy brood could mean a failing queen.



For a 10 frame hive in March/April, it is ideal to identify at least 4 frames double sided with eggs, larvae, and brood in one of the two hive bodies. The diagram above outlines the frames and where you are most likely to find brood in your hive.

TREATING FOR DISEASES AND PESTS

Keeping your bee hives healthy is an important component of modern beekeeping. Below are two common maladies honey bees suffer from: Nosema and Varroa destructor. Less prevalent diseases and parasites, but still occurring in Montana are: American/European Foulbrood, Chalkbrood, Wax Moth, and Dwarf Wing syndrome.

Nosema

Nosema apis usually causes dysentery-like symptoms like distended abdomens and defecation in the hive.

Medication: Fumagillin B

A 24 gram bottle of Fumagillin B costs about \$25 and is enough to treat 2 ½ hives. A 96 gram bottle of Fumagillin B costs about \$45 and is enough to treat 9 ½ hives. This assumes that each hive consists of 2 deeps and is treated with 2 gallons of medicated syrup. The shelf life of Fumagillin B is about 3 years if kept in a cool dark place.

Directions: prepare 2:1 sugar/water syrup by dissolving 8 lbs. sugar in ½ gallon of water. Dissolve 1 rounded teaspoon (5 grams) Fumagillin-B in a small volume of lukewarm water and stir into the syrup. This recipe yields 1 gallon of medicated syrup.

Fall treatment: Feed 1 gallon of medicated syrup for each deep hive box full of bees (2 gallons for each 2 deep colony).

Spring treatment: Feed ½ gallon of medicated syrup for each deep hive box full of bees (1 gallon for each 2 deep colony).

Varroa destructor (mite)

Varroa mites transmit pathogens like bacteria and viruses that are damaging to bee health. The mite is currently the Western honey bee's single most detrimental pest. A simple way to see if your hive has mites is to check your bottom board for fallen mites.

Medication: Treatment strategies against the mites are numerous and variable, such as: Bayer's bee gate, Mite Away Strips, Apivar, and Oxalic Acid. A preferred method amongst many beekeepers is Oxalic Acid. It is currently known to be easy on the bees, and 95% effective against Varroa mites.

Directions: The recommended dosage of Oxalic Acid is one gram per brood chamber. The vaporizer is to be placed under bee hive (with bottom board removed) and a towel covering entrance. DO NOT breathe the vapors. ONLY treat when honey supers are removed.

Fall treatment: Use Oxalic Acid vaporizer in late August/early September. Treating at this time is killing the mites that are emerging with brood and before they enter another brood cell about to be capped. Vaporize 3 times at 5 day intervals.

Spring treatment: It is best to treat any new hives (purchased or swarmed). Wait until you see eggs before vaporizing.

*As a member of Big Sky Beekeepers, you will have access to the club's vaporizer. Otherwise, Oxalic Acid (wood bleach) can be found at your local Hardware store, and a vaporizer can be purchased online.

GLOSSARY

A

Abscond = When the entire colony of bees abandons the hive because of pests, disease or other adverse conditions.

Alarm pheromone = A chemical (iso-pentyl acetate) substance which smells similar to artificial banana flavoring, released near the worker bee's sting, which alerts the hive to an attack.

American Foul Brood = With American Foul Brood the larvae usually dies after it is capped, but it looks sick before. The brood pattern will be spotty. Capping's will be sunken and sometimes pierced. Recently dead larvae will string when poked with a matchstick. The smell is rotten and distinctive.

Apiary = A bee yard.

Apiarist = A beekeeper.

Apiculture = The science and art of raising honey bees.

Apis mellifera = The bee originating in Europe.

B

Balling = Worker bees surrounding a queen either to confine her because they reject her or to confine her to protect her.

Bearding = When bees congregate on the front of the hive

Bee bread = Fermented pollen stored in the hive and used to feed brood and the queen.

Bee brush = Soft brush or whisk or large feather or handful of grass used to remove bees from combs

Bee Parasitic Mite Syndrome aka Parasitic Mite Syndrome = A set of symptoms that are caused by a major infestation of Varroa mites. Symptoms include the presence of Varroa mites, the presence of various brood diseases with symptoms similar to that of foulbroods and sacbrood but with no predominant pathogen, AFB-like symptoms, spotty brood pattern, increased supersedure of queens, bees crawling on the ground, and a low adult bee population.

Beehive = A box with movable frames, used for housing a colony of bees.

Beek = Beekeeper

Beekeeper = One who keeps bees. An Apiarist

Beeswax = A substance that is secreted by bees by special glands on the underside of the abdomen, deposited as thin scales, and used after mastication and mixture with the secretion of the salivary glands for constructing the honeycomb. Beeswax melts at approximately 145°F (63°C). The flashpoint is 400°F (204.4°C)

Boardman feeder- They go in the entrance and hold an inverted quart mason jar.

Bottom board = The floor of a bee hive.

Bottom supering = The act of placing honey supers under all the existing supers, directly on top of the brood box. The theory is the bees will work it better when it's directly above the brood chamber; as opposed to TOP supering which would be just putting the supers on top of the existing supers.

Brood = Immature bees not yet emerged from their cells; in other words, egg, larvae or pupae.

Brood chamber = The part of the hive in which the brood is reared; may include one or more hive bodies and the combs within. Sometimes used to refer to a deep box as these are commonly used for brood.

Brood nest = The part of the hive interior in which brood is reared; usually the two bottom boxes.

Burr comb = Small pieces of comb outside of the normal space in the frame where comb usually is. Brace comb would fall into this category.

C

Candy plug = A fondant type candy placed in one end of a queen cage to delay her release.

Capped brood = Immature bees whose cells have been sealed over with a brown wax cover by other worker bees

Cappings = The thin wax covering over honey; once cut off of extracting frames.

Castes = The three types of bees that comprise the adult population of a honey bee colony: workers, drones, and queen.

Cell = The hexagonal compartment of a honey comb.

Chalkbrood = This is caused by a fungus *Ascosphaera apis*. It arrived in the US in 1968. The main cause is too much moisture in the hive.

Chilled brood = Immature bees that have died from exposure to cold; commonly caused by mismanagement or sudden cold spells.

Chimney = When the bees fill only the center frames of honey supers.

Clipping = The practice of taking part of one or both wings off of a queen both for discouraging or slowing swarming and for identification of the queen.

Cluster = The thickest part of the bees on a warm day, usually the core of the brood nest. On a day below 50F the only location where the bees are. It is used to refer both to the location and to the bees in that location.

Colony = The aggregate of worker bees, drones, queen, and developing brood living together as a family unit in a hive or other dwelling

Colony Collapse Disorder = A recently named problem where most of the bees in most of the hives in an apiary disappear leaving a queen, healthy brood and only a few bees in the hive with plenty of stores.

Comb = The wax portion of a colony in which eggs are laid, and honey and pollen are stored shaped like hexagons.

Comb foundation = A commercially made structure consisting of thin sheets of beeswax with the cell bases of worker cells embossed on both sides to induce the bees to build a particular size of cells.

D

Dearth = A period of time when there is no available forage for bees, due to weather conditions (rain, drought) or time of year.

Deformed Wing Virus = A virus spread by the Varroa mite that causes crumpled looking wings on fuzzy newly emerged bees.

Disease resistance = or Hygienic Bees. The ability of an organism to avoid a particular disease; primarily due to genetic immunity or avoidance behavior.

Double story or Double deeps = Referring to a beehive wintering in two deep boxes.

Drawn combs = Full depth comb ready for brood or nectar with the cell walls drawn out by the bees,

completing the comb as opposed to foundation that has not been worked by the bees and has no cell walls yet.

Drifting = The movement of bees that have lost their location and enter hives other than their own home. This happens often when hives are placed in long straight rows where returning foragers from the center hives tend to drift to the row ends or when making splits and the field bees drift back to the original hive

Drone = The male honeybee which comes from an unfertilized egg (and is therefore haploid) laid by a queen or less commonly, a laying worker.

Drone brood = Brood, which matures into drones, reared in cells larger than worker brood. It is noticeably larger than worker brood and the capping's are distinctly dome shaped.

Drone Congregation Area = A place that drones from many surrounding hives congregate and wait for a queen to come. In other words a mating area. Drones find them by following both pheromone trails and topographical features of the landscape such as tree rows.

Drone layers = A drone laying queen (one with no sperm left to fertilize eggs) or laying workers.

Drone laying queen = A queen that can lay only unfertilized eggs, due to age, improper or late mating, disease or injury.

Dysentery = A condition of adult bees characterized by severe diarrhea (as evidenced by brown or yellow streaks on the front of the hive) and usually caused by long confinement (from either cold or beekeeper manipulation), starvation, low-quality food, or nosema infection.

E

Eggs = The first phase in the bee life cycle, usually laid by the queen, is the cylindrical egg 1/16in (1.6 mm) long; it is enclosed with a flexible shell or chorion. It resembles a small grain of rice.

Entrance reducer = A wooden strip used to regulate the size of the entrance.

European Foulbrood - European Foul Brood is a brood disease.

Extracted honey = Honey removed from combs usually by means of a centrifugal force (an extractor) in order to leave the combs intact.

F

Feral (queen or bees) = Since all North American bees are considered to have come from domestic stock, what most people call "wild" bees are really "feral" bees. Some use the term for survivor bees that were captured and used to raise queens meaning they WERE feral as opposed to ARE feral.

Fertile queen = An inseminated queen.

Festooning = The activity of young bees, engorged with honey, hanging on to each other usually to secrete beeswax but also in bearding and swarming.

Frame = A rectangular structure of wood designed to hold honey comb, consisting of a top bar, two end bars, and a bottom bar; usually spaced a bee-space apart in the super.

Forage = Natural food source of bees (nectar and pollen) from wild and cultivated flowers. Or the act of gathering that food.

Foragers = Worker bees which are usually 21 or more days old and work outside to collect nectar, pollen, water and propolis; also called field bees.

Foundation = Thin sheets of beeswax embossed or stamped with the base of a worker (or rarely drone) cells on which bees will construct a complete comb (called drawn comb); also referred to as comb foundation, it comes wired or unwired and also in plastic as well as one piece foundations and frames as well as different thicknesses (thin surplus, surplus, medium) and different cell sizes (brood =5.4mm, small cell = 4.9mm, drone=6.6mm).

G

Guard bees = Worker bees about three weeks old, which have their maximum amount of alarm pheromone and venom; they challenge all incoming bees and other intruders

H

Hive = A home for a colony of bees.

Hive body = A wooden box containing frames. Usually referring to the size of box being used for brood.

Hive stand = A structure serving as a base support for a beehive; it helps in extending the life of the bottom board by keeping it off damp ground. Hive stands may be built from treated lumber, cedar, bricks, concrete blocks etc.

Hive tool = A flat metal device with a curved scraping surface or a lifting hook at one end and a

flat blade at the other; used to open hives, pry apart and scrape frames.

Honey = A sweet viscid material produced by bees from the nectar of flowers, composed largely of a mixture of dextrose and levulose dissolved in about 17 percent water; contains small amounts of sucrose, mineral matter, vitamins, proteins, and enzymes.

Honey bee = The common name for *Apis mellifera*.

Honey Bee Healthy = A mixture of essential oils (lemon grass and peppermint) sold to boost the immune system of the bees.

Honey crop = The honey that was harvested.

Honey extractor = A machine which removes honey from the cells of comb by centrifugal force.

Honey flow = A time when enough nectar-bearing plants are blooming.

Honey supers = Refers to boxes of frames used for honey production. From the Latin "super" for above as a designation for any box above the brood nest. That bees can store a surplus of honey.

I

Infertile = Incapable of producing a fertilized egg, as a laying worker or drone laying queen. Unfertilized eggs develop into drones.

Inner cover = An insulating cover fitting on top of the top super but underneath the outer cover, with an oblong hole in the center. Used to be called a "quilt board". In the old days these were often made of cloth.

Instrumental insemination aka II or AI = The introduction of drone spermatozoa into the spermatheca of a virgin queen by means of special instruments

Italian bees = A common race of bees, *Apis mellifera ligustica*, with brown and yellow bands, from Italy; usually gentle and productive, but tend to rob.

J

K

Kashmir Bee Virus = A widespread disease of bees, spread more quickly by Varroa, found everywhere there are bees.

Kenya Top Bar Hive = A top bar hive with sloped sides. The theory is that they will have less attachments on the sides because of the slope.

L

Landing board = A small platform at the entrance of the hive for the bees to land on before entering the hive.

Langstroth hive = The basic hive design of L.L. Langstroth. In modern terms any hive that takes frames that have a 19" top bar and fit into a box 19 7/8" long. Widths vary from five frame nucs to eight frame boxes to ten frame boxes and from Dadant deeps, Langstroth deeps, Mediums, Shallows and Extra Shallow. But all would still be Langstroths. This would distinguish them from WBC, Smith, National DE etc.

Large Cell = Standard foundation size = 5.4mm cell size

Larva, open = The second developmental stage of a bee, starting the 4th day from when the egg is laid until it's capped on about the 9th or 10th day.

Larva, capped = The second developmental stage of a bee, ready to pupate or spin its cocoon (about the 10th day from the egg).

Laying workers = Worker bees which lay eggs in a colony hopelessly queenless; such eggs are infertile, since the workers cannot mate, and therefore become drones.

Leg baskets = Also called pollen baskets, a flattened depression surrounded by curved spines located on the outside of the tibiae of the bees' hind legs and adapted for carrying flower pollen and propolis.

Long hive = a hive that is laid out horizontally instead of vertically.

M

Mandibles = The jaws of an insect; used by bees to form the honey comb and scrape pollen, in fighting and picking up hive debris.

Marking = Painting a small dot of enamel on the back of the thorax of a queen to make her easier to identify and so you can tell if she has been superseded.

Mating flight = The flight taken by a virgin queen while she mates in the air with several drones.

Mating nuc = A small nuc for the purpose of getting queens mated used in queen rearing. These vary from two frames of the standard size used by that beekeeper for brood, to the mini-mating nucs sold for that purpose with smaller than normal frames.

Medium = A box that is 6 5/8" in depth and the frames are 6 1/4" in depth. AKA Illinois AKA Western AKA 3/4 depth.

Medium brood (foundation) = When used to refer to foundation, medium refers to the thickness of the wax NOT the depth of the frame. In this case it's medium thick and of worker sized cells.

Migratory beekeeping = The moving of colonies of bees from one locality to another during a single season to take advantage of two or more honey flows or for pollination.

Moisture content = In honey, the percentage of water should be no more than 18.6; any percentage higher than that will allow honey to ferment.

Mouse guard = A device to reduce the entrance to a hive so that mice cannot enter. Commonly #4 hardware cloth.

N

Nasonov = A pheromone used given off by a gland under the tip of the abdomen of workers that serves primarily as an orientation pheromone.

Nasonoving = Bees who have their abdomens extended and are fanning the Nasonov pheromone. The smell is lemony

Nectar = A liquid rich in sugars, manufactured by plants and secreted by nectary glands in or near flowers; the raw material for honey.

Nectar flow = A period of time when nectar is available.

Newspaper method = A technique to join together two strange colonies by providing a temporary newspaper barrier.

Nosema Nosema disease in U.S. honey bees is caused by one of two (or both) fungi named Nosema apis and Nosema ceranae. Nosema species are obligate, fungus-like, intra-cellular parasites that are limited to specific hosts species.

Nuc, nuclei, nucleus = A small colony of bees often used in queen rearing or the box in which the small colony of bees resides. The term refers to the fact that the essentials, bees, brood, food, a queen or the means to make one, are there for it to grow into a colony, but it is not a full sized colony.

Nurse bees = Young bees, usually three to ten days old, which feed and take care of developing brood.

O

Observation Hive = A hive made largely of glass or clear plastic to permit observation of bees at work

Outer cover = The last cover that fits over a hive to protect it from rain; the two most common kinds are telescoping and migratory covers.

Outyard = Also called out apiary, it is an apiary kept at some distance from the home or main apiary of a beekeeper; usually over a mile away from the home yard.

Oxalic Acid – wood bleach to treat Varroa Mites.

P

Package bees = A quantity of adult bees (2 to 5 pounds), with or without a queen, contained in a screened shipping cage.

Parasitic Mites = Varroa and tracheal mites are the mites with economic issues for bees. There are several others that are not known to cause any problems.

Piping = A series of sounds made by a queen, frequently before she emerges from her cell. When the queen is still in the cell it sounds sort of like a quack quack quack. When the queen has emerged it sounds more like zoot zoot zoot.

Pollen = The dust-like male reproductive cells (gametophytes) of flowers, formed in the anthers, and important as a protein source for bees; pollen is essential for bees to rear brood.

Pollen basket = An anatomical structure on the bees legs where pollen and propolis is carried.

Pollen bound = A condition where the brood nest of a hive is being filled with pollen so that there is nowhere for the queen to lay.

Pollen substitute = A food material which is used to substitute wholly for pollen in the bees' diet; usually contains all or part of soy flour, brewers' yeast, wheat, powdered sugar, or other ingredients. Research has shown that bees raised on substitute are shorter lived than bees raised on real pollen.

Pollen supplement = A mixture of pollen and pollen substitutes used to stimulate brood rearing in periods of pollen shortage

Pollen trap = A device for collecting the pollen pellets from the hind legs of worker bees; usually forces the bees to squeeze through a screen mesh, usually #5 hardware cloth, which scrapes off the pellets.

Proboscis = The mouthparts of the bee that form the sucking tube or tongue

Propolis = Plant resins collected, mixed with enzymes from bee saliva and used to fill in small spaces inside the hive and to coat and sterilize everything in the hive. It has antimicrobial properties.

Pupa = The third stage in the development of the bee during which it is inactive and sealed in its cocoon.

Q

Queen = A fully developed female bee responsible for all the egg laying of a colony.

Queen Bank = Putting multiple caged queens in a nuc or hive.

Queen cage = A special cage in which queens are shipped and/or introduced to a colony, usually with 4 to 7 young workers called attendants, and usually a candy plug.

Queen cage candy = Candy made by kneading powdered sugar with invert sugar syrup until it forms a stiff dough; used as food in queen cages.

Queen cell = A special elongated cell resembling a peanut shell in which the queen is reared; usually over an inch in length, it hangs vertically from the comb.

Queen clipping = Removing a portion of one or both wings of a queen to prevent her from flying or to better identify when she has been replaced.

Queen cup = A cup-shaped cell hanging vertically from the comb, but containing no egg; also made artificially of wax or plastic to raise queens

Queen excluder = A device made of wire, wood or zinc (or any combination thereof) having openings of .163 to .164 inch, which permits workers to pass but excludes queens and drones; used to confine the queen to a specific part of the hive, usually the brood nest.

Queenright = A colony that contains a queen capable of laying fertile eggs and making appropriate pheromones that satisfy the workers of the hive that all is well.

Queen Mandibular Pheromone = A pheromone produced by the queen and fed to her attendants who share it with the rest of the colony that gives the colony the sense of being queenright. QMP is responsible for inhibition of rearing replacement queens, attraction of drones for mating, stabilizing and organizing a swarm around the queen, attracting a retinue of attendants, stimulating foraging and

brood rearing, and the general moral of the colony. Lack of it also seems to attract robber bees.

R

Raw honey = Honey that has not been finely filtered or heated.

Requeen = To replace an existing queen by removing her and introducing a new queen.

Rendering wax = The process of melting combs and capping's and removing refuse from the wax.

Retinue = Worker bees that are attending the queen.

Reversing aka Switching = The act of exchanging places of different hive bodies of the same colony; usually for the purpose of nest expansion, the super full of brood and the queen is placed below an empty super to allow the queen extra laying space.

Robber screen = A screen used to foil robbers but let the residents into the hive.

Robbing = The act of bees stealing honey/nectar from the other colonies; also applied to bees cleaning out wet supers or capping's left uncovered by beekeepers and sometimes used to describe the beekeeper removing honey from the hive.

Ropy = A quality of forming an elastic rope when drawn out with a stick. Used as a diagnostic test for American foulbrood.

Rolling = A term to describe what happens when a frame is too tight or pulled out too quickly and bees get pushed against the comb next to it and "rolled". This makes bees very angry and is sometimes the cause of a queen being killed.

Royal jelly = A highly nutritious, milky white secretion of the hypopharyngeal gland of nurse bees; used to feed the queen and young larvae.

S

Screened Bottom Board = A bottom board with screen (usually #8 hardware cloth) for the bottom to allow ventilation and to allow Varroa mites to fall through. In Europe this is called an Open Mesh Floor.

Scout bees = Worker bees searching for a new source of pollen, nectar, propolis, water, or a new home for a swarm of bees.

Shallow = A box that is 5 11/16 or 5 3/4" deep with frames that are 5 1/2" deep.

Small Hive Beetle = A recently imported pest whose larvae will destroy comb and ferment honey.

Smoker = A metal container with attached bellows which burns organic fuels to generate smoke; used to control aggressive behavior of bees during colony inspections.

Solar wax melter = A glass-covered insulated box used to melt wax from combs and capping's using the heat of the sun.

Sperm cells = The male reproductive cells (gametes) which fertilize eggs; also called spermatozoa.

Spermatheca = A small sac connected with the oviduct (vagina) of the queen bee in, which is stored, the spermatozoa received in mating with drones.

Split = To divide a colony for the purpose of increasing the number of hives.

Starter hive aka a Swarm box = A box of shaken bees used to start queen cells.

Stinger = An organ belonging exclusively to female insects developed from egg laying mechanisms, used to defend the colony; modified into a piercing shaft through which venom is injected.

Sugar syrup = Feed for bees, containing sucrose or table (cane or beet) sugar and hot water in various ratios. Usually 1:1 in the spring and 2:1 in the fall.

Sugar roll test = A test for Varroa mites that involves rolling a cupful of bees in powdered sugar and counting the number of mites dislodged. This was invented as a non-lethal alternative to an alcohol wash or an ether roll.

Super = A box with frames in which bees store honey; usually placed above the brood nest.

Supering = The act of placing honey supers on a colony in expectation of a honey flow.

Supersedure = Rearing a new queen to replace the mother queen in the same hive; shortly after the daughter queen begins to lay eggs, the mother queen often disappears.

Suppressed Mite Reproduction aka SMR = Queens from a breeding program by Dr. John Harbo that have less Varroa problems probably due to increased hygienic behavior..

Surplus honey = Any extra honey removed by the beekeeper, over and above what the bees require for their own use, such as winter food stores.

Survivor stock = Bees raised from bees that were surviving without treatments.

Swarm = A temporary collection of bees, containing at least one queen that split apart from the mother colony to establish a new one; a natural method of propagation of honey bee colonies.

Swarm cell = Queen cells usually found on the bottom of the combs before swarming.

Swarm preparation = The sequence of activities of the bees that is leading up to swarming. Visually you can see this start at backfilling the brood nest so that the queen has nowhere to lay.

Swarming = The natural method of propagation of the honey bee colony.

Swarming season = The time of year, usually late spring to early summer, when swarms usually issue.

T

Telescopic cover = A cover with a rim that hangs down all the way around it usually used with an inner cover under it.

Ten frame = A box made to take ten frames. 16 1/4" wide.

Thorax = The central region of an insect to which the wings and legs are attached.

Top bar = The top part of a frame or, in a top bar hive, just the piece of wood from which the comb hangs.

Top Bar Hive = a hive with only top bars and no frames that allows for movable comb without as much carpentry or expense.

Top feeder – refer to page feeding methods page.

Top supering = The act of placing honey supers on TOP of the top super of a colony in expectation of a honey flow as opposed to putting it under all the other supers, and directly on top of the brood box, which would be BOTTOM supering..

Tracheal Mites = A mite that infests the trachea of the honey bee. Resistance to tracheal mites is easily bred for.

Travel stains = The darkened appearance on the surface of honeycomb caused by bees walking over its surface.

Twelve frame = A box made to take twelve frames. This is 19 7/8" by 19 7/8".

U

Uniting = Combining two or more colonies to form a larger colony. Usually done with a sheet of newspaper between.

Unlimited Brood Nest aka "food chamber" = running bees in a configuration where the brood nest is not limited by an excluder and they are usually overwintered in more boxes to allow more expansion in the spring.

V

Varroa destructor used to be called Varroa Jacobsoni

Veil = A protective netting that covers the face and neck; allows ventilation, easy movement and good vision while protecting the primary targets of guard bees.

Venom allergy = A condition in which a person, when stung, may experience a variety of symptoms ranging from a mild rash or itchiness to anaphylactic shock. A person who is stung and experiences abnormal symptoms should consult a physician before working bees again.

Venom hypersensitivity = A condition in which a person, if stung, is likely to experience an anaphylactic shock. A person with this condition should carry an emergency insect sting kit at all times during warm weather

Virgin queen = An unmated queen bee.

W

Washboarding = When the bees on the landing board or the front of a hive are moving in unison resembling a line dance.

Wax glands = The eight glands located on the last 4 visible, ventral abdominal segments of young worker bees; they secrete beeswax flakes.

Windbreaks = Specially constructed, or naturally occurring barriers to reduce the force of the (winter) winds on a beehive.

Winter cluster = A tight ball of bees within the hive to generate heat; forms when outside temperature falls below 50 degrees F.

Winter hardiness = The ability of some strains of honeybees to survive long winters by frugal use of stored honey.

Worker bees = Infertile female bee whose reproductive organs are only partially developed, responsible for carrying out all the routine of the colony.

Worker comb = Comb measuring between 4.4mm and 5.4mm, in which workers are reared and honey and pollen are stored.

Worker Queen aka laying workers = Worker bees which lay eggs in a colony hopelessly queen less; such eggs are not fertilized.

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